JAX® Mice Data Sheet

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Strain Name: 129-*Trp53*^{tm1Tyj}/J
Stock Number: 002080

View Pricing for USA, Canada or Mexico View Pricing for International Destinations

General Terms and Conditions of Sale

Former Names 129-*Trp53*^{tm1Tyj} (Changed: 03-dec-2003)
129S1/SvImJ-*Trp53*^{tm1Tyj} (Changed: 11-mar-2001)

Strain Common Name 129S3/SvImJ-*Trp53*^{tm1Tyj};
Symbol ***Trp53***^{tm1Tyj};

Product Information
Strain Details

Type JAX® GEMM® Strain - Targeted Mutation;
Additional information on JAX® GEMM® Strains.
Investigator - Mutation Made By Dr. Tyler Jacks, Massachusetts Institute of Technology

Investigator - Donating Dr. Tyler Jacks, Massachusetts Institute of Technology

ES Cell Line D3 (129S2/SvPas)
Appearance white-bellied agouti
Related genotype A^w/A^w

Strain Description
Mice homozygous for the *Trp53*^{tm1Tyj} mutation show no visible phenotype but most develop tumors (principally lymphomas and osteosarcoma) at 3-6 months of age. Heterozygous mice develop tumors at about 10 months of age. These mice model some of the features of human Li-Fraumeni syndrome, a form of familial breast cancer with mutations in TRP53. Homozygous mice may produce a litter before succumbing to tumors.

Strain Development
The *Trp53*^{tm1Tyj} mutant strain was developed in the laboratory of Dr. Tyler Jacks at the Center for Cancer Research at the Massachusetts Institute of Technology. The 129-derived D3 ES cell line was used. The founder mouse was crossed to 129/Sv.

Gene Details

Symbol *Trp53^{tm1Tyj}*

Allele Name targeted mutation 1, Tyler Jacks

Gene Symbol and Name *Trp53*, transformation related protein 53

Chromosome 11

Gene Common Name(s) p53;

Symbol Description The *Trp53* gene encodes a tumor suppressor protein (p53) that is critical for maintenance of normal cellular function, arresting the cell cycle and promoting apoptosis. The MDM2 protein binds TRP53 (p53) keeping levels low and holding apoptosis in check. DNA damage induces phosphorylation of either p53 or MDM2. This prevents the two proteins from interacting, and results in the stabilization and acivation of p53. Mutations in the *Trp53* gene have been found in almost all human cancers with varying degrees of frequency. Mutation frequencies of up to 50-80% are found in human lung, colon, and breast cancer. Mutant TRP53 protein leads to uncontrolled cell growth and tumor development. Mouse Locus Catalog entry

Control Information

Symbol	Control
Trp53^{tm1Tyj}	Wildtype from the colony
Trp53^{tm1Tyj}	129S1/SvImJ 002448

Considerations for Choosing Controls
Control Pricing Information for JAX® GEMM® Strains

Genotyping Protocols

Trp53^{tm1Tyj}

Colony Maintenance

Breeding and Husbandry Expected coat color from breeding:White Bellied Agouti Homozygous males MAY produce a litter, but will most likely only produce 1 litter.

Diet Information LabDiet® 5K52/5K67

Related Strains

Strains carrying *Trp53^{tm1Tyj}* allele:

002101	B6.129S2-*Trp53^{tm1Tyj}*/J
002103	B6;129S2-*Trp53^{tm1Tyj}*/J
002526	C.129S2(B6)-*Trp53^{tm1Tyj}*/J
002547	C3Ou.129S2(B6)-*Trp53^{tm1Tyj}*/J
002899	FVB.129S2(B6)-*Trp53^{tm1Tyj}*/J

Strains carrying other alleles of *Trp53* :

004301 129-*Trp53*^{tm1Hoil}/J

Additional Web Information

Genetic Quality Control Annual Report
New 129 Nomenclature Bulletin

Research Applications

This mouse can be used to support research in many areas including:

Trp53^{tm1Tyj} *related*

Apoptosis Research
Endogenous Regulators

Cancer Research
Increased Tumor Incidence (Lymphomas)
Increased Tumor Incidence (Other Tissues/Organs: osteosarcoma)
Toxicology
Tumor Suppressor Genes

Immunology and Inflammation Research
Intracellular Signaling Molecules

Mouse/Human Gene Homologs
Li-Fraumeni syndrome

Research Tools
Toxicology Research (drug/compound testing)
Toxicology Research (B and T cell deficiency) (xenograft transplant host)

References

Primary Reference

Jacks T, Remington L, Williams BO, Schmitt EM, Halachmi S, Bronson RT, Weinberg RA. 1994. Tumor spectrum analysis in p53-mutant mice. Curr Biol 4 :1-7. [PubMed: 7922305]

Additional References

Price and Supply Information

Strain Name: **129-*Trp53*^{tm1Tyj}/J**
Stock Number: **002080**

Price Details

Prices are based on shipping destination. To view prices, select your shipping destination.

- USA, Canada or Mexico
- International Destinations (EXCEPT Canada and Mexico)

Supply Details

Standard Supply	**Repository-Cryopreserved.** Please refer to the Supply Notes for further information.
Supply Notes	This strain is included in the Induced Mutant Resource collection. **Cryorecovery - Standard** The recovery process begins when a signed agreement form is returned to the Customer Service Department after order placement. Although results vary by strain, at least two males and two females (two pairs) will be provided, typically within 15 weeks of our receipt of the signed agreement form. If the first recovery attempt is unsuccessful or only one pair is recovered, a second recovery will be done, extending the delivery time to approximately 25 weeks. At least one member of each pair will be of known genotype and will carry the mutation if it is a mutant strain. Note that pairs may not reflect the mating scheme utilized by The Jackson Laboratory prior to cryopreservation of the strain. Mating schemes are sometimes modified for successful cryopreservation. Price represents a repository maintenance fee, which includes the cost of recovery of the strain from the cryopreservation resource and the periodic replacement of the frozen embryos used for recovery. **Cryorecovery to establish a Dedicated Supply for greater quantities of mice** One to two pairs will be recovered to establish a Dedicated Supply of mice. Price by quotation. For more information on Dedicated Supply, please contact JAX® Services: Tel: 800.422.MICE (6423) or 207.288.5845; Email: jaxservices@jax.org.
Licensing	See **General Terms and Conditions of Sale** below for Licensing and Use Restrictions.
Control Information	View Control Information in Strain Details. View Control Pricing Information for JAX® GEMM® Strains.

General Terms and Conditions of Sale

View JAX® Mice Conditions of Use.

OncoMouse™ requires a license from DuPont, see Licenses for Strains with OncoMouse™ Technology.
P53 Mice are subject to U.S. 5,569,824 and corresponding license requirements.

The Jackson Laboratory's Genotype Promise

The Jackson Laboratory has rigorous genetic quality control and mutant gene genotyping programs to ensure the genetic background of JAX® Mice strains as well as the genotypes of strains with identified molecular mutations. JAX® Mice strains are only made available to researchers after meeting our standards. However, the phenotype of each strain may not be fully characterized and/or captured in the strain data sheets. **Therefore, we cannot guarantee a strain's phenotype will meet all expectations.** To ensure that JAX® Mice will meet the needs of individual research projects or when requesting a strain that is new to your research, we suggest ordering and performing tests on a small number of mice to determine suitability for your particular project.

Ordering and Purchasing Information

- Purchasing Information
- JAX® Mice Orders
- Surgical Services

Contact Information

Orders & Technical Support
Tel: 800.422.MICE (6423) or 207.288.5845
Fax: 207.288.6150
Technical Support Express E-Mail Form

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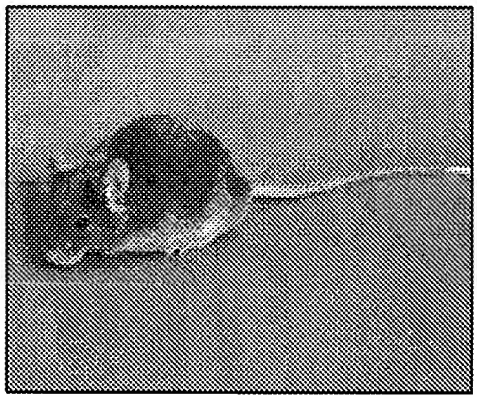
MEDULLOBLASTOMA MOUSE MODELS

Medulloblastomas are the most common pediatric tumor of the posterior fossa[1]. They generally develop in children between the ages of 3 to 9 and make up about 20% of all childhood brain tumors. Medulloblastomas are more common in males than females. Most arise from the primitive neuroectoderm and grow into the fourth ventricle, causing anterior displacement with associated hydrocephalus.



Patched mutant B6;129-Ptch^{tm1Mps} (Stock Number: 003081).

Though there has been significant progress using mouse models to study medulloblastomas, the molecular and genetic basis of the disease is not clearly understood. Mouse strains having targeted mutations of the tumor supressor gene (*Trp53*), the Hedgehog pathway gene Patched 1 (*Ptch*), and the DNA repair enzyme ADP-ribosyltransferase (NAD+; poly (ADP-ribose) polymerase) 1 (*Adprt1*), also known as PARP, are considered valuable models for studying medulloblastomas. The Jackson Laboratory maintains strains that are defective in *Trp53*, *Ptch*, and *Adprt1* (See Table 1). Notably, the B6;129-*Ptch*^{tm1Mps} strain developed by Dr. Matthew Scott is a model for Gorlin's syndrome and is perhaps one of the most widely used medulloblastoma models.

Recently, mouse models developed by Wetmore and colleagues, and by Tong and colleagues have shown to be potentially very useful for medulloblastoma research[1,2]. By using a combination of stains that are defective in *Trp53*, *Ptch*, and *Adprt1*, they have generated two mouse models that display a more aggressive medulloblastoma phenotype.

More than 95% of mice that are homozygous null for *Trp53* and heterozygous for *Ptch* develop tumors in the posterior fossa between 10 and 12 weeks of age[1]. In contrast, *Trp53* homozygous null mice, which exhibit some of the features of Li-Fraumeni syndrome, develop spontaneous medulloblastomas with an incidence of approximately 5%[3]. *Ptch* heterozygous mice develop medulloblastoma-like tumors with an incidence of approximately 14% by 6 months of age, while *Ptch* homozygous null mice die during embryogenesis[1].

Slightly less than 50% of mice homozygous null for both *Trp53* and *Adprt1* develop brain tumors starting at 8 weeks of age, with males developing more than twice as many tumors as females, a phenomenon also seen in humans[2]. Histological analysis shows that 30% of brain tumors are localized in the cerebellum, and large tumors often compress the cerebellar hemispheres and invade the fourth ventricle[2]. Although mice homozygous null for both *Trp53* and *Adprt1* do not develop tumors at the same rate as mice that are homozygous null for *Trp53* and heterozygous for *Ptch*, they represent a novel model for human medulloblastoma.

While The Jackson Laboratory does not maintain colonies of mice homozygous null for both *Trp53* and *Adprt1* or mice homozygous null for *Trp53* and heterozygous for *Ptch* at this time, researchers may use our JAX® Services Custom Breeding expertise to create special crosses using our existing medulloblastoma models. For additional information on JAX® Services, visit our Web site at www.jax.org/jaxmice/services. If you are interested in ordering any of the existing medulloblastoma models, please contact Customer Service (See page 12 for contact information).

Strain Name	Stock Number
B6.129S2-*Trp53*^{tm1Tyj}	002101
B6;129-*Ptch*^{tm1Mps}	003081
129S-*Adprt1*^{tm1Zqw}	002779

Table 1. The Jackson Laboratory maintains several strains that serve as models for studying medulloblastomas.

REFERENCES:

[1] Wetmore C, Eberhart DE, Curran T. Loss of p53 but not ARF accelerates medulloblastoma in mice heterozygous for patched. *Cancer Res* 2001; 61:513-516.

[2] Tong WM, Ohgaki H, Huang H, Granier C, Kleihues P, Wang ZQ. Null mutation of DNA strand break-binding molecule poly(ADP-ribose) polymerase causes medulloblastomas in p53(-/-) Mice. *Am J Pathol* 2003; 162:343-352.

3 Eberhart CG. Medulloblastoma in mice lacking p53 and PARP: all roads lead to Gli. *Am J Pathol* 2003;162:7-10.

[4] Goodrich LV, Milenkovic L, Higgins KM, Scott MP. Altered neural cell fates and medulloblastoma in mouse patched mutants. *Science* 1997; 277:1109-1113.